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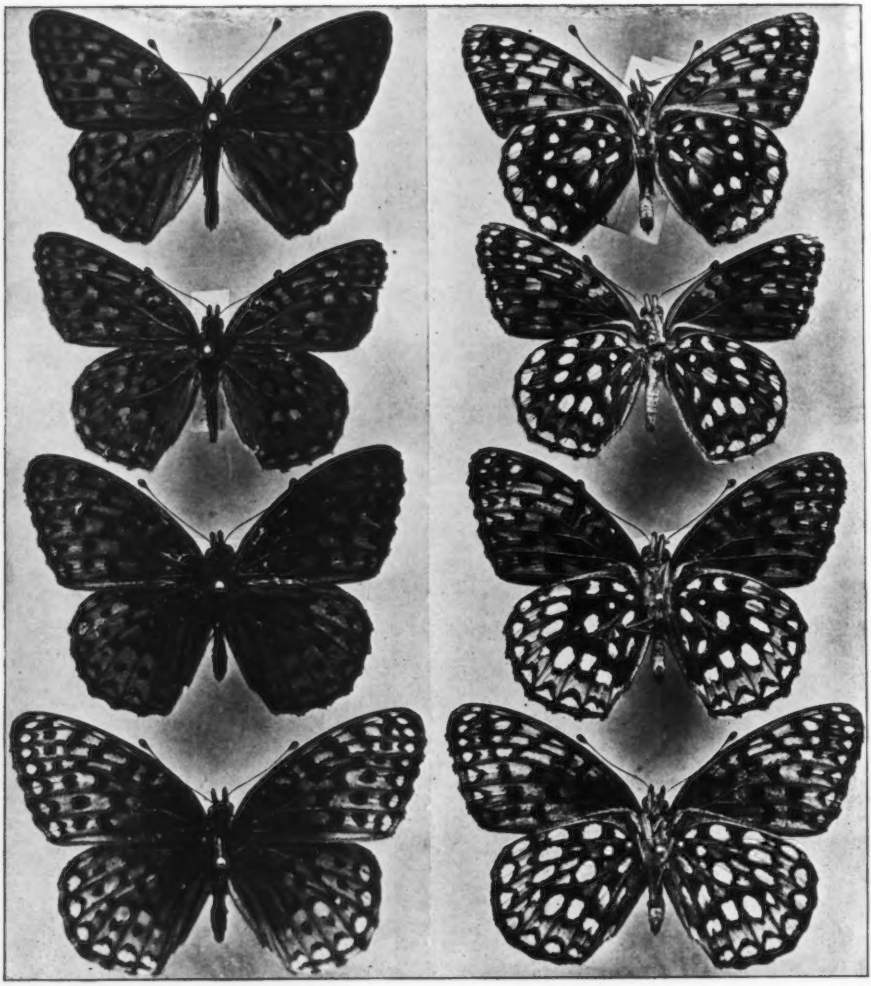

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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. IV. SEPTEMBER, 1893. No. 7.

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OUR illustration this month represents the upper and under-sides of two species of *Argynnis* lately described by Mr. W. H. Edwards. The specimens are in the fine collection of Prof. Edw. T. Owen, of Madison, Wis., and the negative from which the half-tone was made was supplied by Prof. Owen. Next to the Hesperidæ, the species of *Argynnis* are probably the most difficult to illustrate in this way. The species were described in the "Canadian Entomologist."

—o—

MEDICO-ENTOMOLOGY.

By JOHN HAMILTON, M.D., Allegheny, Pa.

Stinging by Hymenoptera. In continuation of this subject from an article on p. 51 of this volume, and volume i, p. 143, it is desired to place on record the result of a personal experiment made by the writer last Summer.

The muscle and nerve which pass over the point of the elbow were injured by a fall, and six weeks afterwards remained quite painful. In August, while collecting, some wasps (*Polistes*) were observed on some flowers, and a trial of the efficacy of stinging

was suggested. Five were successively caught, and each allowed to insert its sting twice along the course of the tendon and nerve, as well also as a black hornet (*Vespa maculata*). The sting of the *Polistes* is very long and slender, and the wound quite painful; that of the *Vespa*, while much coarser and shorter, causes less pain. The stinging was followed by some tumefaction and an unpleasant, numb sensation, which lasted several hours; when these ceased all pain from the arm was gone and did not return. While stinging may be a paliative in some of the chronic forms of rheumatism, from the nature of that disease, of itself, it could not possibly effect a cure. Enough of authentic examples, however, exist showing that it may be employed with advantage in certain neuralgic affections (the rheumatism of the unprofessional) and in traumatic injuries of the nerves and muscles. So far as known, no unpleasant sequences have ever occurred from the stings of Hymenoptera in any part of the body supplied by nerves originating in the spinal cord; but in stinging about the face and head which are supplied by nerves proceeding from the brain itself great care should be taken to avoid wounding these nerves, otherwise a fatality might occur, as cases are on record similar to the one which follows, witnessed by the writer: While watching the hiving of a swarm of bees in a lawn in a country village, the owner, an oldish gentleman, was seen to suddenly fall; reaching his side in an instant, he was found to be almost pulseless and scarcely breathing; artificial respiration was instituted by an assistant, and soon medicinal remedies were at hand, camphor, ammonia, etc., and a teaspoonful of compound spirits of æther administered; in the space of half an hour heart action and respiration were sufficiently re-established. The sting, which remained in the puncture, had penetrated the supra-orbital nerve a little above where it leaves the orbit. Should any one be induced to try enkentric treatment, this danger in applications about the head should not be overlooked.

Carpenter Bees.—It may not be so well known to entomologists as to country boys, that bees which alight on timothy stalks and ripening grain are drones and may be handled with impunity. Acting on this knowledge, one day last Summer, the writer picked a bumble-bee from a grass stalk and proceeded to examine it for *Stylops;* suddenly he concluded that he had met with an exception to the rule about drones and timothy stalks, having

unexpectedly received near the point of one of his fingers what was supposed to be a sting, and severely painful, the blood flowed freely, and there was a deep transverse cut about three-eights of an inch in length. This seemed a rather curious sting. An examination, with judicious care, showed that the bee was really a drone, and that its other end possessed a weapon more formidable than any sting—a long, sharp, sickle-shaped pair of mandibles of horny chitin. Whether it is the habit of *Xylocopa* to use the jaws as an offensive and defensive weapon, or whether the occurrence mentioned was accidental, can only be known by experimenting, which the writer does not propose to institute personally—an occasional sting is not greatly regarded, but he does not care to be bit.

Hypoderma.—An imago of a species of this genus is the parent of the well-known *warble* which is frequently seen on the backs of cattle. It is said the eggs are conveyed into the mouths of cattle when licking themselves, where, soon hatching out in the fauces and throat, the larvæ penetrate through the various tissues till they reach the skin of the back, where they remain till fully grown, escaping to the ground for pupation through the ulcerated tumors they occasion. Several years ago I saw, professionally, a boy, six years of age, who had been suffering for some months from the glands on one side of his neck being swollen and a fœtid ulceration around the back teeth of the lower jaw of the same side. Three months' treatment was of no avail, and the end seemed near; one day a white object, which was seen to move, was observed in the ulcer at the root of the tongue, which, on being carefully extracted, proved to be a large grub, which, from having frequently seen them, I recognized as a full grown larva of *Hypoderma.* It was of the usual tawny color, about half an inch long when contracted, about one-third that thickness and quite lively. The case ended fatally. This boy had been on a dairy farm in Illinois the previous fall, where probably the egg was in some way taken into his mouth, and the larva found between the base of the tongue and the jaw suitable tissue in which to develop, coming to maturity at the same time with those bred in cattle.

Prof. PACKARD is said to have been offered the Hope professorship of Zoology at Oxford, England, to succeed the late Prof. Westwood, but declined, as he did not wish to leave America.

FOOD-PLANTS OF GRAPTA ZEPHYRUS.

By Thomas E. Bean.

Early in August, 1890, I collected *zephyrus* larvæ of various ages from third stage to those nearly mature, at an elevation of about 5800 feet, feeding on *Ribes lacustre*, a gooseberry very common near Laggan, though also very local. They were taken home, and with them a supply of the plant, on which they were fed for a day or two, during which time several made pupa. The supply of gooseberry being exhausted, and the nearest locality for it quite distant, I was obliged to consult the botanies for a substitute. Of accessible plants rose seemed most plausible for trial. Accordingly, the wilderness of their can was made to blossom with the rose, and the *Graptas* (there were ten or more) were introduced. They climbed up on the awning in a long procession to inspect the new Bill of Fare—looded askance at the rose twigs and went away to look for a gooseberry patch. Prospects for success of the experiment looked dark, but I persevered in giving the botanical ultimatum a fair test. And the *Graptas*, after many journeys around the can and a great amount of "beating about the bush" (rose bush), reluctantly *admitted the analogy* between rose and gooseberry, and began to tackle the rose leaves. They successfully fed up, and I have to-day ten fine rose-fed *zephyrus* in my collection. The butterflies are mostly smaller than those from gooseberry. Since that time on one occasion I found a single larva of *zephyrus* on rose, at a distance from any of the known food-plants of the species. But when collecting the larvæ in 1892, found freely in one locality on gooseberry only, and in another place on *Menziesia glabella* only, both localities within four miles of Laggan, none could be found on rose. Although the fact cannot be considered fully proved, my experience in 1892 seems to indicate that in this district *zephyrus* has a *local habit* in regard to its food-plants:—where the larva was found feeding on gooseberry I found none on other plants in that immediate locality; where it was feeding on *Menziesia glabella* careful search failed to detect any on either gooseberry or rose in the same locality. Possibly the facts observed may simply mean that *zephyrus* has a scale of preference in food-plants; *Menziesia glabella* being the preferred plant, with gooseberry as a second choice. I have tried no further experiments,

but think it likely that *Fragaria* and *Spiræa* might be accepted as food-plants by *zephyrus* in case of necessity.

Azalea occidentalis was recorded by Henry Edwards as the food-plant of *zephyrus* in the Yosemite.

———o———

ELEMENTARY ENTOMOLOGY.

LEPIDOPTERA–HETEROCERA (Moths).

By Prof. JOHN B. SMITH, New Brunswick, N. J.

As they are arranged in our list to-day, the Noctuidæ begin with a series of what may be termed Bombyciform moths, having some of the appearance of the Notodontidæ, both in the adult and larval stages. We find, in some cases, the retracted head, short tongue and woolly vestiture, which gradually merges into forms like *Acronycta*, which are typically Noctuid, of a whitish color usually, and, as a rule, with black markings which show a decided tendency to the Greek *psi* character. These are followed by a series of rather small, slight-bodied moths—whitish, green, red, or brightly colored, with rather large wings, of which *Bryophila* is typical. The typical Noctuina follow, and contain a series of robust forms with comparatively short, stiff wings, and usually sombre or quite modest colors. The larvæ are largely cut-worms, and as such to be reckoned among the foes to agriculture. One of the most numerous series is that of the *Agrotes*, all of them distinguished by naked eyes and spinose tibiæ. In a very large proportion of the species the front is modified into a tubercle, or is at least roughened. The thoracic clothing and the tuftings vary much, as does indeed not only the wing, but the body form, many being quite depressed and flattened, while others are quite cylindrical and with cylindro-conic abdomen. Quite a number of genera, and about fifteen per cent. of all our species, are represented in this series. This is followed by *Mamestra* and its allies, all of them with hairy eyes, smooth front, and non-spinose tibiæ. In their appearance and habitus they are not unlike the *Agrotes*, and have the same prevailing dusky colors with, indeed, fewer exceptions. In the next following Hadenids we find again naked eyes, but unarmed tibiæ, and here again the front is not modified. The habitus is much the same as before, and the body parts may be tufted or untufted; this and the wing-

form serving to separate genera. *Oncocnemis* differs from the surrounding allies by the possession of a claw on the fore tibia. Through a series of more brightly colored forms we reach a series of species and genera which are of a prevailing rusty or red-brown tint, and of these *Hydræcia* may be considered typical. They are Hadenids in most of their structural characteristics; but color, wing form and vestiture, differ slightly, the latter much more inclined to hairy. With *Nonagria* we begin a series of forms in which the transverse maculation becomes less obvious and a distinct tendency to a strigate type is manifested. *Leucania*, with a predominating white color and hairy eyes, is the leading genus. The following Tæniocampid series is characterized by hairy eyes and a usually reddish or brown color, the vestiture varying from scaly to hairy. The front is always smooth and the tibiæ are never spinose, the anterior armed in one genus only. The relation of this series to the forms classed under or near *Mamestra* is sometimes close.

Similar in color, but much brighter, with naked eyes and a usually smoother vestiture, are the Orthosiids, which often have somewhat large wings and more slender, untufted bodies and tend in some directions to flattened or depressed body, leading gradually to what may be called the Xyliniform series. Here the wings become narrower, more elongate, usually parallel, and the outer margin is scarcely oblique. The head is frequently retracted and the eyes quite usually furnished with long lashes, though they may be hairy or entirely naked. In *Xylina* we have the typical form, which changes gradually to the type seen in *Cucullia*, where the wings are lanceolate and the thoracic tufting is curiously developed. *Anomis* and *Aletia* seem to form the bridge to the Plusiid series, in which we have bright, often metallic colors, unarmed front and legs, naked eyes, a very characteristic thoracic and abdominal tufting, and in the larva a distinct tendency to the looper or Geometrid type, the prolegs decreasing in number.

Next follows a series of moths resembling the Plusiids in the metallic colors and in the thoracic tuftings. The wings are broader, however, with a tendency to become somewhat falcate at tip, the front is protuberant and pitted, and the fore tibiæ are armed with a curved claw. From this type we have a gradual merging into the Heliothid type. Here we have bright, con-

trasting colors: white, sometimes silvery, often yellow, and sometimes red. As a rule, the tibiæ are spinose, and very often the anterior are shortened and heavily armed at tip, the genus *Schinia* being particularly distinguished in this direction. *Anarta* and its allies are related to some of the Heliothids, the Plusiids, and to Annaphila, through which we lead into the Acontiids. The latter are mostly small species, usually brightly colored, with close scaly vestiture, and closely scaled, unarmed legs. The eyes are naked, and the front is rarely modified. Following this series we reach another of a very decidedly different type—the Catocalinæ of Mr. Grote. The colors are sombre in most instances, at least so far as the primaries are concerned, and the secondaries are frequently maculate. A peculiarity of a large proportion of these species is that the transverse posterior line on the primaries makes an abrupt inward bend below the reniform, leaving a prominent, square, often white or pale patch above it. In *Syneda*, and its near allies, the secondaries are yellow or yellowish, or red, leading into *Catocala*, in which they are yellow, red, or black, and usually banded. In the latter genus the larvæ are semi-looped. In this series and the forms immediately following, we have usually or rather close, scaly vestiture, particularly on the abdomen, which is usually smooth and cylindro-conic. The palpi are smooth, upright, and usually reach at least to the vertex, while the wings are large, leading to the Erebid series, in which both pairs of wings are similarly marked by transverse lines. At the end of the family we find the Deltoid series, so called from the fact that many of them, when at rest, have the form of the Greek letter *delta*. They are usually easy of recognition by the unusually long palpi, which are sometimes curved, sickle-shaped over the head, sometimes projected straight forward, snout-like, clothed with upright scales. In this series we find some of the most interesting secondary sexual characters that are known in the order.

———o———

ON THE GENERA OF THE FAMILY CYNIPIDÆ.

By H. F. Bassett.

It is to be regretted that the work of genus-making in this family had not been deferred until the dimorphism of most of the species had become known, and the relationship of the two forms had in each case been ascertained.

The work in this line done by Hartig and Forster will eventually either give place to a new classification, or if preserved must fasten on the species a nomenclature extremely awkward and bewildering.

Hartig's work applied to any other family of insects would have been in every way correct and satisfactory, and the only objections urged against Forster's classification have been that his genera are too often founded upon characters so obscure as to render their identification in very many cases difficult, if not impossible, and that he founded on these obscure characters far more genera than were necessary for a family comparatively small even now, when the number of species has been very largely increased. They thought the old Linnaean genus needed division, for they had no intimation of the strange life-history of many of the species that belonged to it, and that when this should become known nearly half their species, and not a few of their genera would disappear.

The genera founded within the last twenty-five years have not only been labor lost, but have added to the literature of the subject much that has no real scientific value.

When Dr. Adler and others had traced the history of the European species known to them, they found that many species not only had two specific names but that in not a few instances a species had been placed in widely different genera. Now, two forms of an insect, differ they ever so widely, do not constitute two species, and they are, if possible, still further from a generic separation.

In his several articles on the North American Cynipidæ, Baron Osten-Sacken did not venture to establish new genera, though in one instance he grouped species that he thought might be found to have generic relations, but he still adhered to his plan of placing all the Hymenopterous *oak gall makers* in the genus *Cynips*. This he did, it seems, mainly for two reasons: the distinctive character of most of our species which barred them out of genera founded on European species and the rapid accumulation of new material in this country. I can but think it would have been better if we had followed his example till such time as our knowledge of our species should be far more complete than it is even now.

I know how strong the temptation is to emphasize the peculiarities of a remarkable species by giving them generic value, but

inasmuch as these features are probably confined to one of the two forms of dimorphic species, it may happen that our new genus has no generic foundation whatever, for it would be unwise, if not impossible, to found a genus upon the characters of both forms of a dimorphic species.

If we must form genera in the present incomplete state of our knowledge of these insects (I cannot see *why* we must) let us decide without delay which of the two forms of a species shall be the basis of our genus. This should be, it seems to me, the bisexual brood, as being the normal form of the species. All naturalists will agree that the multiplication of synonymns is an evil, and all are glad to find species that the imperfect knowledge of dabblers has not loaded down with names.

To preface the history of an insect with a half page of real or supposed synonyms may give the impression that the writer has complete knowledge of his subject, but it often shows that "somebody has blundered," and it has sometimes happened that the compiler has made a jumble that another half page will hardly set right.

While the field of scientific research is open to all, and no one has exclusive right to any part, it still remains true that too great care cannot be taken in the naming, classifying and identification of species, and that this cannot be safely undertaken without a knowledge of what others before us have done.

The time has not come when a safe and permanent classification of the gall-making Cynipidæ can be made, and it will not come until some of our entomologists shall do for our species what the Continental entomologists have done for the European species—learn by observation and experiment their true life-history.

The discovery, and the careful description of new species is valuable, but in the classification of these let us adopt the motto of our society—*Festina lente.*

———o———

The Early Stages of Plusia bimaculata Steph.

By Rev. T. W. FYLES, South Quebec.

Eggs.—Laid dispersedly in the end of July; round, yellowish white; hatched August 3d.

Young larva.—Half-looper; one-tenth of an inch long, yellowish white; subdorsal lines white; head and body sparsely set with

long, light brown hairs rising from brown dots; head bluish white. Food-plant *Taraxacum*. Larva moulted August 12th.

After first moult.—Two-eighths of an inch long; pea-green, with white subdorsal and side lines. Moulted August 20th.

After second moult.—Length nine-twentieths of an inch; color pale pea-green; subdorsal and side lines yellowish white; spiracles of the same color; between the subdorsal lines the back is mottled with yellowish white. Moulted September 1st.

After third moult.—Length three-fourths of an inch; no perceptible change in color and markings. Moulted September 15th.

Full grown larva.—One inch and a quarter long; somewhat attenuated towards the head; color pale green; dorsal line darker green—this line is widened in the middle of every segment, thus ; the side lines are white. The larva spun up September 24th, gathering some of the leaves about it.

Cocoon.—Silken, rather flimsy, yellowish white.

Part of the brood went into hibernation after second moult.

———o———

Los Angeles County, California, Rhopalocera taken from Feb. 16 to 28, 1893.

By Ernest J. Oslar.

1. *Danais archippus.*
2. *Agraulis vanillæ.*
3. *Melitæa editha.*
   " *palla.*
   " *rubicunda.*
   " *chalcedon.*
4. *Phyciodes mylitta.*
5. *Vanessa antiopa.*
6. *Pyrameis atalanta.*
   " *cardui.*
   " *carye.*
7. *Junonia cœnia.*
8. *Cœnonympha california.*
9. *Thecla irus.*
   " var. *arsace.*
   " *dumetorum.*
10. *Chrysophanus helloides.*
11. *Lycæna antiacis.*
    " var. *behrii.*
    " *acmon.*
12. *Pieris vernalis.*
13. *Anthocharis cethura.*
    " *reakirtii.*
14. *Meganostoma eurydice.*
15. *Colias ariadne.*
    " *harfordii.*
16. *Papilio rutulus.*
    " *zolicaon.*
17. *Pamphila napa.*
18. *Pyrgus tessellata.*
19. *Nismiades icelus.*
    " *pacuvius.*

Took the same things in March, with the addition of

1. *Melitæa gabbii.*
2. *Argynnis semiramis.*
" *callippe.*
3. *Pieris beckerii* and *sisymbri.*

Diurnal Heterocera.

4. *Melicleptria pulchripennis.*
5. *Heliaca fasciata.*

INSECTS ATTACKING VANILLA BEANS.—A little microscopic mite, belonging to Tyroglyphidæ, is not unfrequently found upon vanilla beans. A few of these were examined as appearing on a lot of old beans not long since, and they did not very greatly differ from what Hassall classifies as *Acarus sacchari*, the sugar-mite. In the "Druggists' Bulletin" of a few months ago a similar mite was spoken of in vanilla bean. The outside of these beans looked perfect, but "on opening the bundles they presented a different appearance from the outside ones, and the odor was different." They also appeared full of white specks and seemed crumbly. These minute insects resembled the itch insect. It is said that persons handling old beans are frequently attacked with a disease very much resembling the itch, and this parasite is the cause of it. They burrow under the skin and produce all the symptoms of itch.

Carpenter says of the Tyroglyphidæ, the cheese-mite family, that they are by far the most destructive of all *Acarina*, swarming in countless numbers and devouring hay, cheese, drugs, growing plants and roots, etc.

SOME MORE BLACKBERRY AND RASPBERRY INSECTS.—In reply to Prof. Smith's criticism in the June number of ENT. NEWS, p. 197, I would say that a number of larvæ and one additional chrysalis of *Grapta comma* were found on the blackberry. Another species to be added to the list is *Hemileuca maia* Dru., the larvæ being found in considerable numbers feeding on the foliage near Wooster, Ohio. Dr. D. S. Kellicott also has them from southern Ohio, feeding on the same plant. Dr. John Hamilton has also sent me the following notes on the Coleoptera included in my bulletin: "*Bassareus mammifer*, Mr. Beutenmüller says, may be found on blackberry. This is quite true, provided the bushes be found under or near a walnut or hickory, which are its natural food-plants. *Cryptocephalus notatus* Fab., *4-maculatus* Say, is the blackberry depredator. *Chelymorpha argus:* The natural food of this plant is the *Convolvulaceæ*, and as both the plant and beetle are abundant in alluvial grounds the imago wanders off to every plant in the vicinity, but while they may occasionally eat at some of these plants it is not likely to be more than accidental. They do not certainly eat corn plants, but seem very fond of the water which is often contained in the axil of the leaves." White grubs (*Lachnosterna*) are also injurious to the blackberry and raspberry.

F. M. WEBSTER.

ENTOMOLOGICAL NEWS.

Published monthly (except July and August), in charge of the joint publication committees of the Entomological Section of the Academy of Natural Sciences, of Philadelphia, and the American Entomological Society. It will contain not less than 300 pages per annum. It will maintain no free list whatever, but will leave no measure untried to make it a necessity to every student of insect life, so that its very moderate annual subscription may be considered well spent.

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PHILADELPHIA, PA., SEPTEMBER, 1893.

PENNSYLVANIA has been the birthplace and home of a number of entomologists of eminence, and its chief city, Philadelphia, has the distinction of being the birthplace of the American Entomological Society, which has done so much to advance the study of Entomology in this country. The practical application of the study in the way of economic entomology seems to have been entirely neglected, and Pennsylvania has no State entomologist as far as we know, at least we have never seen anything in the way of work from such an individual, and if he exists we know it not. The State Agricultural College probably receives the annual grant of $15,000 per annum under the provisions of the Hatch bill, but none of it has probably ever gone toward the study and investigation of insect depredations. We are away behind our sister States in this respect, and in the home of Say, Melsheimer, Haldeman, Leidy, LeConte, etc. Economic entomology appears to be unknown. Why should Pennsylvania be behind the other States in this respect? It can't be that the State has no injurious insects, but that its legislators are in ignorance of the value and importance of such studies.

THE ornithologists of America and their friends have erected a monument to Aububon in Central Park, New York, which we believe cost ten thousand dollars. It has been suggested by one of the members of the American Entomological Society that the entomologists of America should erect a monument to the memory of Thomas Say, who might well be called the father of American entomology. Entomology, as a study of value to mankind, is of more practical importance than ornithology, and the entomologists of this country should take as much pride in honoring one of their distinguished deceased brethren as the bird men.

PICTURES FOR THE ALBUM OF THE AMERICAN ENTOMOLOGICAL SOCIETY have been received from Theo. D. A. Cockerell, J. Alston Moffat, C. W. Stromberg, S. H. Scudder, Frank S. Daggett. There are plenty of entomologists left whose pictures should adorn our album, and we hope they will go see their photographer soon.

DEPARTMENT OF ECONOMIC ENTOMOLOGY.

Edited by Prof. JOHN B. SMITH, Sc. D., New Brunswick, N. J.

The Summer of 1893.—It is perhaps somewhat early to characterize the present season, and yet it has proved itself an extremely interesting one in many particulars. The intense cold of the Winter of 1892–93 led many to believe that there would be quite a wholesale destruction of insects, and in some cases this seems to have proved true. Yet, on the other hand, insects like the potato beetle were as numerous as ever, and the striped *Diabrotica* was not perceptibly affected. *Epilachne borealis*, on the other hand, became a rare insect, and only an occasional specimen here and there, was visible. *Systena blanda* assumed the dimensions of a pest in some parts of New Jersey, and attacked a very great variety of plants. In one case an entire crop of carrots was destroyed. Beets were considerably eaten; canteloupe and other cucurbs were quite generally infested, and even corn was attacked. Nothing suffered worse than the Pig Weed, though I heard no complaints of the injury caused on this particular crop. The Elm leaf beetle wintered in excellent condition, and made its appearance in very great numbers. Trees suffered more than ever at New Brunswick, and in some cases there remained not a leaf on the trees on July 15th. In many places the ground was covered with the fallen leaves as in Autumn, and the trees had a desolate appearance. In fact, as a rule, insects hibernated well, and there is every reason why that should be so. The steady cold maintained the continued torpidity of the species hibernating in the adult stage, and preserved from the danger of being crushed by the heaving of wet ground those species that wintered as subterranean pupæ.

The Relation of Insect Attacks and Plant Diseases.—It has been observed, time and again, that weakly plants suffered most from insect attack, while vigorous healthy plants appeared free, or nearly so. Of course this may be in a very great measure due to the fact that, by means of its abundant vitality, the healthy plant is capable of sustaining an amount of injury which would be fatal to a weakling; but this is by no means universally true. I have frequently noticed on a considerable variety of plants that the smaller and less thrifty contained the greater number of specimens of the injurious species, and this, where the original stunting of the plant was not due to the insect attack. I have also noticed that in many cases plants attacked by fungous or bacterial diseases prove especially attractive to insets I found, in an onion field for instance, a small number of specimens with a bacterial disease beginning at the heart of the bulb. These bulbs were in almost every case covered by white mites, which seems to find these plants much more to their taste than neighboring healthy bulbs on which very few, if any, examples were to be found. These same plants, too, became, in a somewhat later stage, food for the

larva of one of the Muscid flies. Wherever the bulb was exposed, masses of white eggs were to be found, and soon the maggots were at work aiding the disease. Usually the maggots were accused of being the authors of the injury, but erroneously so. I have frequently noticed in other connections that the slightest trace of a soft rot, whether caused by a fungus or bacteria, attracted insects who were then, frequently, charged with all the injury caused. On the other hand, insect injury very often served to give entrance to the germs of plant disease, and the latter finishes what the first began. In the tomato field a fruit bitten into by the larva of *Heliothis armiger* is almost certain to become victim to bacterial decay, and to infect every other fruit with which it is in contact.

The lesson of this is, of course, to have plants that are healthy. This is much more often within the control of the farmer than is thought at first sight, especially in all crops that are set out. It is too much the practice to put out weaklings, with the idea that they will catch up with the others later on. They may, and often really do so, but more usually they fall victim to disease and insects, or give only a very inferior yield.

Insects and parasitic diseases work hand in hand, and either will follow the other as the case may be. The true theory is to give neither a foothold if possible.

Vitality in Insects.—Instances of great vitality in insects are not rare, but I was quite surprised at the resistance offered by a Muscid larva which I found in decaying onions. I wished to preserve a few specimens, and placed them in a dish containing ninety-five per cent. alcohol, expecting to find them dead in a few minutes. Half an hour thereafter they were yet very lively, and were squirming about at a great rate. I removed some of them to a mixture containing acetic acid 25 per cent., alcohol 25 per cent., water 50 per cent., and added an alcoholic solution of eosin to those left in the original liquid. About two hours thereafter the specimens were yet alive and those in the stained liquid has assumed a pretty red tint, that extended, apparently, to some of the internal structures. Punctured two specimens and they died almost immediately. Those in the acetic acid solution were not dead when I left the laboratory, but were dead next morning. This experiment was rather interesting, and I placed a number of the maggots in a hellebore decoction—one ounce to one gallon of water. They lived in this half a day or more, and in a decoction of double that strength lived several hours. Afterward, I poured over a few infested onions fully half a pint of the one ounce to one gallon decoction, and twenty-four hours thereafter no ill effects were noted on the specimens. Placed several of the maggots in a solution of kainit—two ounces to one pint of water, and in this they lived thirty-six hours; took them out, placed them on a dry board and covered with a glass dish, under which they lived yet twenty-four hours, one of them changing to a pupa during that time. A solution of nitrate of soda, one ounce to one quart of water, killed all that were placed in it within thirty-six hours.

These experiments become interesting from the fact that Mr. Fletcher

has found the hellebore decoction a very satisfactory remedy for the cabbage maggots, and I have found that both the kainit and nitrate of soda solutions were exceedingly fatal to many subterranean forms.

Orange Insects form the subject of a large part of a special bulletin of the Louisiana State Experiment Station, and this part is prepared by Prof. H. A. Morgan. There is little that is new in this paper, which covers rather more than fifty pages, but the compilation is good, and the work of the insects in Louisiana is described. So, if there was little room for new observation on pests that have been so well studied by Hubbard, Comstock and others, yet the work is far from being a compilation merely, and will be most useful to the *Citrus* growers in Louisiana, for whom it is especially intended. It is to be much regretted that both paper and presswork of the pamphlet are exceedingly poor.

The Insect Pests of the Tobacco are very incidentally treated in Bulletin No. 44, of the Alabama Station, by Mr. A. J. Bondurant, where they are reduced to the "Cut worm" and the "Horn worm." Both are figured, and I very much regret that I am unable to reproduce the picture of the "Cut worm," which is an artistic curiosity, or an entomological monstrosity, or both. No better remedies than digging out the one, and picking off the other are recommended, though the poisoned bait traps for the "Cut worm" and the poisoned "Jimpson Weed" flowers for the *Sphinx* have proved very successful.

The Insect Enemies of Small Grains are treated by Mr. Lawrence Bruner, in the annual report of the Nebraska State Board of Agriculture for 1893, and, as usual, Mr. Bruner has done his work well, even though it is compilation in very great part. The tedium of entomological literature is somewhat relieved by the attractive frontispiece illustrating a grasshopper orchestra singing the well-known ballad "In this wheat by-and-bye."

The Classification of Insects and their Relation to Agriculture.—This is the title of Bulletin 28 from the Minnesota Station, and its author is Dr. Lugger. The Bulletin is very popularly written, and is very largely a picture book. The definitions that are given of the various divisions are of the most general possible description, and are in themselves insufficient to give even an idea of the creatures to which they are known to be applied. Supplemented by the pictures they become intelligible, and probably some information will be gained by the farmers that can be persuaded to read it through. Following the descriptive part of the Bulletin we have a chapter on applied or practical entomology, in which both natural and artificial methods of destroying insects are described. There is nowhere a very definite statement of exactly what cases are adapted for natural or artificial methods, and altogether the Bulletin is very general and indefinite. It is not quite such a one as we have been in the habit of expecting from Dr. Lugger, and he certainly does not do himself justice. There are few points that are absolutely inaccurate, but one matter is of some importance not only to the farmers of Minnesota, but to those of

other States. Speaking of London purple, Dr. Lugger says it has the advantage that it can be used with the Bordeaux mixture, and he says if Paris green is used for a similar purpose, we are very apt to increase its injury upon foliage. This is strictly incorrect: Paris green can be as safely used as London purple with the Bordeaux mixture, but it must not be used with any fungicides containing ammonia, because the ammonia dissolves the arsenite of copper. London purple, on the other hand, can be used with fungicides of this description, because the arsenite of lime is not attacked by the ammonia. This is a very important point, and one upon which I have always placed great stress. It is the ammonia that renders the use of Paris green inadvisable in any fungicides containing it. Wherever lime is present in the fungicides it will be apt to prevent any trace of injury to the leaves by any of the arsenites.

The Horn Fly Again.—This insect forms the subject of Bulletin 14 of the Central Experimental Farm, Ottawa, Canada, and in it Mr. Fletcher gives a brief statement of the life-history of the insect, and also a record of its appearance and spread in Canada. Nothing new is added to our knowledge of the insect, but the Bulletin is mentioned here principally to record the fact that in New Jersey the fly is becoming less and less abundant. In several localities in the southern part of the State, where, a few years ago, the fly was in the greatest abundance, they are now very much less in number than the common stable fly, *Stomoxys calcitrans*. Exactly what has led to this reduction in numbers I have no means of knowing, but the fact is undoubted.

The Boll Worm.—This insect forms the subject of Bulletin 29 of Division of Entomology United States Department of Agriculture, and it is written by Mr. F. W. Mally. The Bulletin is an excellent one. It is too long to abstract with any degree of justice, and only its scope can be mentioned here. The method and extent of injury on various plants are recorded, the life-history of the species is given, the parasites are mentioned and briefly described; the insects preying upon it are referred to, and finally the injuries to the plants caused by other insects and charged to the Boll worm are detailed. The subject of remedies forms the most important part of the Bulletin, and is, of course, the most interesting. Attacking the insects by light proved distinctly unfavorable, or, as Mr. Mally says, "that the use of lights for attracting and trapping the Boll worm moth is entirely useless." The use of poisoned sweets seems to have been more successful. Applied to pea vines, which had been planted as a trap crop, a great many moths were poisoned, and probably a considerable benefit was derived by this method. Mr. Mally, however, does not seem to think very highly of this method either, and does not speak very enthusiastically of it. Quite a number of experiments were made with pyrethrum, either dried, a watery extract, or an emulsified oil extract. All of these were more or less successful on the young larvæ and all were practically unsuccessful on the old or more matured larvæ. The final conclusion is that, trapping the larvæ upon corn planted for that special purpose, would

prove the most satisfactory method of preventing injury that could be devised. The specially interesting series of experiments were those made with bacterial diseases. Quite a number of disease germs were cultivated, but the efforts made to inoculate the Boll worm were in all cases practical failures. This accords very well with what has been observed in other cases, and it lends weight to conclusions that have been arrived at, that insect diseases depend too much upon conditions which are not under the control of man to be at any time considered as reliable, except in very peculiar instances.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

[The Conductors of ENTOMOLOGICAL NEWS solicit, and will thankfully receive items of news, likely to interest its readers, from any source. The author's name will be given in each case for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for certain issue. Owing to low subscription rate, "extras" will be charged for, and when they are wanted, it should be so stated on the MS. along with the number desired. The receipt of all papers will be acknowledged.—ED.

Dr. J. E. TALMAGE, of Salt Lake City, Utah, disposes of the assertion often made that no living thing can exist in the waters of the Great Salt Lake. He records the presence of *Artemia fertilis* Verrill; larvæ of Tipulidæ, probably *Chironomus oceanicus* Packard; a species of *Lorixa*, probably *C. decolor* Uhler; and lastly the larvæ and pupæ of a fly *Ephydra gracilis* Packard.

"HITHERTO the two groups *Macro-* and *Micro-lepidoptera* into which butterflies and moths have been divided have been characterized by the former including all the large and conspicuous species, and the latter only containing small and inconspicuous moths. Dr. Chapman, in a communication to the Entomological Society of London, has endeavored to raise the Micros in general favor by transferring to that group several of our finest moths. According to him the pupa of the Goat-moth (*Cossus ligniperda*) possesses all the characteristics of a typical *Micro-lepidopterous* pupa, and for a similar reason the genera *Sesia*, *Zygæna*, *Procris* and *Hepialus* should be placed among the *Micros*."—*Exchange*.

RECENTLY my attention was called to a cocoon which was found in a shell of the snail known as *Helix albolabris*, collected at Lake Hopatcong, New Jersey. Thinking the cocoon to be that of one of the dipter-

ous parasites, I placed it in a small vial, intending to give it to some dipterist at the first opportunity, but what was my surprise when examining the vial lately to find a specimen of the genus *Pompilus*, one of the fossorial wasps, which proved to be, on identification, *P. luctuosus* Cress. It is well known that species of the family Pompilidæ make nests, generally of mud, storing them with spiders, but I have never heard of them utilizing snail-shells for that purpose, although some species of the bee genus *Osmia* have been known to build in such places. A fact that makes this note more interesting is, that *Pompilus luctuosus* has never before been recorded east of Colorado.—Wm. J. Fox, Phila., Pa.

Instances of Extended Pupal Term. *Pieris sisymbri.*—Several pupæ were bred at Laggan from eggs, in July, 1890; four of these produced butterflies early in June, 1892, all males.

Anthocharis hyantis.—One male and two females emerged late in May, 1891, from chrysalids of 1889.

The above are the only cases in my own experience, of species remaining two Winters in pupa; the fact is on record, however, as to *Anthocharis ausonides*, *A. sara*, *A. genutia*, and some other Lepidoptera.

The extension of pupal term through second Winter may be a commoner incident than we are aware, and I am inclined to consider it an influential factor in causing the wide variance seen in different years in the commonness of certain butterflies. *Anthocharis hyantis* is peculiarly fluctuating in abundance in this locality. It is usually a rare insect, yet, in 1890, it was one of the commonest butterflies during its short time of flight, and it is a certainty that far more than half the *Hyantis*, which have taken flight here in the past seven years, were on the wing in two weeks of that Summer.—Thomas E. Bean.

In a paper in the "Entomologist" for June, 1893, by Robert McLachlan, entitled "The Decadence of British Butterflies, with Suggestions for a Close-time" he mentions the fact that *Aporia cretægi* has probably become nearly extinct in England, if not totally so. Two British butterflies have become extinct, and a third, *Lycæna arion* "shows signs of being dangerously near extinction. *Chrysophanus dispar* was common in former years in the few of the eastern counties where it fed on the great water-dock (*Rumex hydrolapathum*). It disappeared entirely about the year 1850. The other extinct butterfly, *Lycæna acis*, was widely spread over England, but was always extremely local, and seldom, if ever, found in numbers. Its extinction was going on for many years, and probably commenced about 1840. Mr. McLachlan further states that the British butterflies only number about sixty-three species, and that in times gone by the list must have been larger. "I have spoken about the extent to which the direct action of collectors may influence the extinction of a species, and have said that I do not regard it as serious, save in cases where other causes have already put the species far on the road to extinction. But I may have underestimated this matter, and it has occurred

to me latterly, on several occasions, whether a close-time or season could not be enforced for certain British butterflies, the species to be decided upon by a committee of experts, just as has been done for British birds. The idea may seem to some childish and ridiculous, full of paltry sentiment, and so on. But why not protect the beautiful innoxious insects that display their admirable forms and colors, and gladden the hearts of all true lovers of Nature." Around Philadelphia we have about thirty-seven more species of butterflies than there are in all Britain, so it is not childish or ridiculous to preserve these beautiful creatures as Mr. McLachlan suggested, especially where there are so few.

CALIFORNIA NOTES.—Two years ago, while working a mountain stream in a neighboring canyon, several specimens of *Amphizoa insolens* were taken. These attracted the attention of Dr. Horn, on a recent visit, and he expressed surprise that the species should be found so far south, suggesting that I send a note of the capture to the NEWS. In this connection it seems appropriate to note the occurrence here of one or two other northern forms, which, so far as I know, have not been recorded from this part of the State. The following were taken last Summer in the San Bernardino Mountains: *Mysia hornii;* one example of this species beaten from pine. *Chrysophana placida;* three examples also from pines. *Necydalis cavipennis;* a specimen recently emerged, found resting on the trunk of a sugar pine. *Pinus lambertiana;* the trunks of many dead and dying pines revealed numbers of the nearly cylindrical burrows of this fine longicorn, in some of which were the remains of a past generation of beetles. *Pterostichus ater:* two examples of average size, not differing from northern specimens. All the above were found at an altitude of from 4000 to 6000 feet, and would seem to have followed the Sierras south, going higher as they advance, until in this latitude they are found only near the summits of the higher ranges.

The occurrence of a species of *Psephenus* in this locality seems worthy of mention. Specimens submitted to Capt. Casey were identified by him as *lecontei.* On comparing with Massachusetts examples in my cabinet the local specimens show several somewhat constant differences, notably in the more feebly explanate elytral margin and the dark legs, but with the few specimens at hand it is impossible to pronounce upon the value of these differences. It is probable that they are merely geographical.

A specimen of *Rosalia funebris* has been recently received from a friend who took it in San Diego County, probably introduced there, as suggested to me by Dr. Horn, in Oregon timber.—H. C. FALL, Pomona, Cal.

Identification of Insects (Imagos) for Subscribers.

Specimens will be named under the following conditions: 1st, The number of species to be **limited to twenty-five** for each sending; 2d, The sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly. Exotic species named only by special arrangement with the Editor, who should be consulted before specimens are sent. Send a 2 cent stamp with all insects for return of names. Before sending insects for identification, read page 41, Vol. III. Address all packages to ENTOMOLOGICAL NEWS, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

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* Contains new species other than North American.

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UNTERSUCHUNGEN UBER DIE FAUNA DER GEWASSER BOHMENS, I. Metamorphose der Trichopteren II, Serie, von Prof. Fr. Klapalek (Archiv d. Naturwis. Landesdurchforschung von Böhmen, viii, 6). Prague, 1893, 143 pp., numerous figures.

DIE PILZGARTEN EINIGER SUDAMERIKANISCHER AMEISEN von Alfred Möller. Jena, Gustav Fischer, 1893, 127 pp,, 7 pls., 4 text figures.

THE LIFE OF A BUTTERFLY. By Samuel H. Scudder. Received from Henry Holt & Co., Publishers, New York.—This little book of 182 pages, with four plates and an index, treats of the life-history of *Anosia plexippus*, the milkweed butterfly. The character of the book is well sketched out in the author's preface, which reads as follows: "In the following work I have tried to present in untechnical language the story of the life of one of our most conspicuous American butterflies. At the same time by introducing into the account of its anatomy, development, distribution, enemies and seasonal changes, some comparisons with the more or less dissimilar structure and life of other butterflies, and particularly of our native forms, I have endeavored to give, in some fashion and in brief space, a general account of the lives of the whole tribe. By using a single butterfly as a special text, one may discourse at pleasure of many." This book should be a great service to the beginner, as it is very entertainingly and instructively written, and, as the author states, is a guide to the life-histories of all butterflies. It is divided into eleven chapters, the first of

which gives a general account and the remainder are devoted to the anatomy, physiology, habits, vagrancy, mimicry and protective resemblance, critical periods of life, etc.

BRIEF GUIDE TO THE COMMONER BUTTERFLIES OF THE NORTHERN UNITED STATES AND CANADA. Being and introduction to a knowledge of their life-histories. By Samuel Hubbard Scudder. Published by Henry Holt & Co., New York; 12mo., 206 pp.—The book begins with a chapter entitled, "What are Butterflies?" and is followed by others on structure, etc., of the imago, egg, caterpillar and chrysalis, the lives and habits of caterpillars, how the chrysalis hangs, variation, etc., sexual differences, senses, mimicry and protection, classification of butterflies, followed by an interesting and valuable chapter describing some of the more important works on American butterflies. Next follow keys to the various groups based on the perfect butterfly, the caterpillar and chrysalis. The body of the work is made up of the descriptions of the imago, egg, caterpillar and chrysalis, etc., of the species treated. The work ends with an appendix of instructions for collecting, rearing, preserving and studying, and the whole makes a work that no beginner can well get along without.

NEW SPECIES OF NORTH AMERICAN INSECTS DESCRIBED IN THE PRECEDING LITERATURE.

ARACHNIDA.

Sabacon spinosus Weed, Amer. Nat. xxvii, p. 575, fig., N. Hampshire.

COLEOPTERA.

Buprestidæ: *Micrasta* n. gen. 4 n. sp., Mexico, Kerremans, Ann. Soc. Ent. Belg. xxxvii, p. 115.

Euclasea obliqua Lewis, Ann. Mag. N. H. (6), xi, p. 425, Mex.

DIPTERA.

Mallophora megachile Coquillett, Can. Ent. xxv, p. 118, Cal. *Nicocles argentatus*, p. 119, Cal.

Sarcophaga leucaniæ Townsend, Psyche, vi, p. 468, Ill.

Euaresta latipennis Townsend, Zoe, iv, p. 13, Mex.

Dexinæ, Muscinæ, Anthomyinæ: n. gen. and sp., Mexico. Giglio-Tos, Boll. Mus. Zool. Comp. Anat. Univ. Torino, viii, No. 147.

HEMIPTERA.

Coccidæ: n. sp., Cockerell, Journ. Inst. Jam. I, p. 254–256.

Ceroplastes psidii cistndiformis Cockerell, Zoe, iv, p. 104, Guanajuato, Mexico.

Cosmopepla cœruleata Montandon, Proc. U. S. Nat. Mus. xvi, p. 47, Venez., Cent. Am. *C. Uhleri*, p. 48, Calif., Nev. *Dendrocoris pini*, *Sinea Rileyi*, p. 51, Calif.

Dactylopius virgatus Cockerell, Entom. xxvi, p. 178, Jam.

HYMENOPTERA.

Fossorial: n. sp. Fox, Can. Ent. xxv, pp. 115–117.

LEPIDOPTERA.

Acronycta (*Triæna*) *Grotei* Butler, Ann. Mag. N. H. (6), xi, p. 400, N. Y., Kans. *A.* (*T.*) *Smithii*, p. 401, id.

Lagoidæ: *Dalcerides* n. gen. for *Artaxa ingenita* H. Edw., Neumoegen & Dyar, Can. Ent. xxv, p. 121. New Notodontidæ, Saturniidæ, Lithosiidæ, Hepialidæ, pp. 121–125.

Phyllodesma Dyari Rivers, Can. Ent. xxv, p. 144, Texas.

Grammodes concolor Grote, Can. Ent. xxv, p. 155, Savannah.

MYRIAPODA.

Archilithobius 4 n. sp., *Lithobius* 1 n. sp., Kenyan, Can. Ent. xxv, pp. 161–162, Neb.

ORTHOPTERA.

Stenobothrus olivaceus Morse, Psyche vi, p. 477, Conn.

THYSANURA.

Smynthurus spinatus Macgillivray, Can. Ent. xxv, p. 127, N. Y. *S. floridanus*, p. 127, Fla. *Anoura magua*, p. 128, Ohio.

The Entomological Section

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

PROCEEDINGS OF MEETINGS.

May 25, 1893.

A regular stated meeting of the Entomological Section of the Academy of Natural Sciences was held in the Hall, S. W. cor. Nineteenth and Race Streets, this evening, Mr. E. T. Cresson in the chair. Thirteen members and associates present. The chairman announced that we had with us a distinguished entomologist, Dr. S. H. Scudder, of Cambridge, Mass. The Publication Committee reported in favor of publishing the following papers in the "Transactions" of the American Entomological Society: A Synopsis of the Harvest Spiders of South Dakota. By C. M. Weed. Seventh Contribution to a Knowledge of Certain Little-known Aphididæ. By C. M. Weed. The Cosmetidæ of the United States. By C. M. Weed. Mr. W. J. Fox exhibited a new species of *Sphex* which he had received from Mrs. A. T. Slosson, who had captured it in Florida. The characters of the species were given, and the name *exornatus* proposed for it. Dr. Scudder announced that he had lately presented to the American Philosophical Society for publication, a paper on fossil insects. The dipterous family Tipulidæ was treated. The bulk of the work was based on mate-

rial from Florissant, Col. Sixty species were taken into consideration. About half the genera are extinct, not including half the species. The neuration of some of the newly-described genera were explained by drawings on the black-board. In reply to a question the speaker stated that in most cases the neuration was exceedingly well preserved. Mr. Calvert said that, in his account of the local Odonata, he had been led to make a careful study of the thorax. The key to such a study he had found in the anatomy of the thorax in the genera *Calopteryx* and *Hetærena*. The speaker gave at length the anatomy of this part of the Odonata, and aided his discourse by black-board drawings. C. F. Seiss was duly elected a member of the Section, and Mr. W. H. Patton, of Hartford, Conn., and Dr. H. G. Griffith, of Manayunk, associates.

Dr. H. SKINNER, *Recorder.*

JUNE 12, 1893.

A regular stated meeting was held on this evening. Mr. Welles in the chair. Eleven members and associates present. A communication from the New York Entomological Society suggesting the appointment of a field meeting on July 4th was received, and, on motion, a committee consisting of Messrs. Johnson, Skinner and Laurent, was appointed to reply to the same, and make such arrangements as deemed best. Mr. Johnson exhibited for Dr. Skinner a chrysalis of *Feniseca tarquineus*, which somewhat resembles a monkey's face. The larvæ is carnivorous, and feeds on plant lice. The specimens were reared by Miss Emily L. Morton. Mr. Calvert described the characteristic wing-veining of the two suborders of the ODONATA, *Zygoptera* and *Anisoptera*, and illustrated by black-board sketches the apparent manner in which the triangle of the latter was derived from quadrilateral of the former PHILIP P. CALVERT,

Acting Recorder.

The following papers were read and accepted by the Committee for publication in ENTOMOLOGICAL NEWS:

STEM GALL ON EPHEDRA NEVADENSE.

By C. H. TYLER TOWNSEND.

On Oct. 10, 1891, I found near Joblin's Ranch, San Andres Mountains, on stems of *Ephedra nevadense*, numbers of small, elongated galls, from which the occupants had emerged, as was shown by a small hole in each gall. This is the only case that has ever come under my notice of an insect affecting this plant. Whether it possesses some acrid principle, by virtue of which it is distasteful to most insects, I cannot say.

The gall may be cecidomyidous, or it may be hymenopterous. I think it more probable that it is the former. It may be described as follows:

Gall.—Length 11–13 mm.; width 3½–4⅓ mm. An elongated perfect swelling of the stem-like shoots of the plant near their ends, the swellings or galls being about three times as long as thick; subcylindrical, placed always immediately above a joint, the lower end terminating at the joint and subtruncate, the upper end sloping quickly from all sides into the distal portion of the stem, which extends upward in a line with the longitudinal axis of the gall. External surface of gall longitudinally finely fluted or furrowed, being the exaggerated minute longitudinal flutings of the stem of the plant developed in size by the process of swelling. Color of dried galls greenish or straw colored, doubtless green in life. The gall maker emerges always at the lower end, the exit hole in each gall being just a little above the joint, about one-third the length of the gall or less from its lower end. The dried gall grows a little less in diameter on its lower portion, and especially so on the side containing the exit hole where the adjacent portion is collapsed, doubtless due to drying. This gives the upper end the greatest diameter. The dried galls are very hard, somewhat woody; opening them discloses a central longitudinal channel in which the larval occupant lived.

Described from three old galls. I am inclined to regard this as a cecidomyidous gall.

———o———

LIFE-HISTORY OF PAPILIO EURYMEDON Boisd.

By HARRISON G. DYAR, Boston, Mass.

Papilio eurymedon Boisd.

Egg.—Nearly spherical, the base flattened, smooth, slightly shining, yellowish green with a reddish shade on one side, which causes it to resemble a miniature unripe wild coffee berry. Diam. 1.3 mm. Laid singly on the upper side of the leaves of its food-plant.

First larval stage.—Head rounded, black, shining, partly retracted under joint 2; width .8 mm. Body shaped as in other species of *Papilio*, smaller centrally, with rows of spinose tubercles, the row i very small, the subdorsal row ii large, especially the ones on joint 2 on each side of the cervical shield, and on joints 3, 4, 12 and 13; lateral row iii small. Color dark brown, becoming later velvety-black, the cervical shield pale brown and a white saddle-shaped spot on joints 7 and 8.

Second stage.—Head slightly retracted under joint 2; rounded, shining, dark brown, paler over the clypeus and mouth; ocelli black; a few short hairs over the lower part of head; width 1.3 mm. The subdorsal tubercles on joints 2, 11, 12 and 13, are

rather long, with a few setæ; all the rest very short, smooth, round and shining. Color pale brown, mottled with darker brown, a white saddle on joints 8–10, pointed posteriorly and reaching forward on the sides; pale subventrally, and a whitish subdorsal line; joint 2 is yellowish, and joints 12 and 13 paler than the rest of the body. Below the tubercles of row iii, on joints 3, 4 and 6, is a velvety-black spot. As the stage advances the color becomes greenish, especially subventrally.

Third stage.—Head pinkish brown, mouth-parts paler, ocelli black; width 1.8 mm. On joint 2 an ocherous, slightly spinose, subdorsal tubercle, and a slighter one on joint 12, all the rest reduced to round, shining, slight elevations. The body is enlarged at joints 4–6, elsewhere nearly uniform in size. Color dark green, paler at the sides, slightly shaded with blackish and minutely dotted with yellowish; on joints 7–9 a white saddle, excavated before and pointed behind, passing slightly below the obscure, broken, narrow, white, subdorsal line, and containing two faint green dorsal spots; joints 12 and 13 whitish. The tubercles of rows i to iii on joint 4 are quite distinct, rounded, shiny dark brown, and connected by a pale brown band. The subdorsal line runs between tubercles ii and iii, and just above it is a black bar, and below it a minute blue dot encircled with black. There are no other blue dots perceptible, but a blackish subdorsal one on joint 9. The elevated shiny dots on joints 3, 5 and 11 are ocherous or brown. Anterior edge of joint 2 yellow; scent-horns brown.

Fourth stage.—Head as before; width 2.7 mm.; joint 2 narrowly yellow anteriorly, the tubercles on each side of the opening orange tinted. Body dark green, whitish subventrally and minutely dotted with yellowish, only traces of the saddle-shaped spot in diffuse subdorsal whitish patches and an arrow-shaped dorsal spot on joint 9, and even these disappear before the stage is completed. On joints 12 and 13 a small, yellow, subdorsal tubercle. On joint 4 the tubercles of rows i to iii are small, round, orange tinted; the tubercle i has on it and below it an elongated black-ringed patch, a blue dot; below tubercle ii a black line dividing a yellow, black-ringed, pyriform spot that covers tubercles ii and iii, enclosing above tubercle iii a black-ringed blue spot. There are no other blue dots, the places of the absent subdorsal tubercles being slightly paler green than the

ground color. Stigmatal line absent; spiracles brownish, pale ringed. In the incisure, between the joints 5 and 6, is a black band, edged with yellow, anteriorly, concealed when the larva is at rest, but suddenly exposed when the presence of an enemy is suspected.

Fifth stage.—Head rounded, the sutures deep, minutely wrinkled and clothed with very short pile; pinkish brown, whitish around the mouth; ocelli black; width 3.8 mm. Body entirely smooth, uniform soft green, whitish at the sides and beneath, and minutely, but obscurely dotted with yellowish; joint 2 is yellow anteriorly around the slit for the scent organ. The marks on joint 4 are without tubercles, and consist of a rounded triangular orange spot in a black edge, below it a pale blue dot, then a black edged pyriform spot, very slightly excavated in front and produced on its lower posterior side, divided above the middle by a transverse black line (above which it is orange, below yellow) and containing a violet dot in a broad black border. As the stage advances this mark becomes terra cotta color, except the lower part of the pyriform spot, which is yellow, shaded with terra cotta. In the fold between joints 5 and 6 is a black band edged with yellow anteriorly, reaching over the dorsum to the lateral region on each side. On joints 5, 9, 10 and 11 deep blue dots represent the former tubercles of rows i and ii; on joints 5 to 12 a substigmatal row of deep blue dots and on joint 5 a subdorsal and lateral pale blue dot. Spiracles small, white, surrounded by a broad brownish border; scent organ orange.

Chrysalis.—Cylindrical, the abdomen tapering, no depression between thorax and abdomen, a blunt trigonate thoracic prominence projecting forward parallel, with a similar process over each eye; a slight lateral projection at base of wing-case and a row of subdorsal abdominal granular elevations, three of which are most distinct. Color wood-brown, longitudinally streaked with olive-brown; wing-cases grayish; a subdorsal line of deep brown shading over the dorsum, continued as a broad shade to the end of the thoracic projection; a broad, lateral, similarly colored band, extending the whole length, diffuse on its upper edge; a brown shade on the wing-cases basally, below the cell and a greenish shade on the leg-cases. Length 35 mm.; width 9 mm.

Food-plant.—Wild coffee (*Rhamnus californica* Esch.).

Peculiar form of Argynnis erinna Edw.

By Prof. Ed. T. Owen.

Size, form and colors of *Arg. erinna*, in whose habitat it was taken. On the fore wing, on a strip one-fourth of an inch wide from apex to posterior angle; the usual black markings appear but faintly suggested; this absence of black is compensated by considerable black venation. On the rest of the wing the usual black marks are heavily confluent. The hind wing has a similar strip of like width on which venation marks alone appear. The black markings within are again equally confluent. Corresponding modifications exist on lower surfaces, except that on both fore and hind wings there has been an effort to fuse the outer row of silver spots with the next adjacent silver spots, which has resulted in a washing of the usual tawny band with yellow.

Hab.—Klamath County, Oregon.

In the hope that this aberrant form may recur, I venture to name it *cunninghami*, after the gentleman who captured it.

———o———

Note on a Tick from the Ear of a Coyote.

By C. H. Tyler Townsend.

A coyote was shot by the writer on the evening of Aug. 3, 1892, near La Vega de San José, in Valencia County, N. Mex. The ears were immediately cut off and tied outside upon the top of a high covered wagon to dry in the sun. In this isolated position they remained uninterruptedly until August 6th, when they had begun to smell. On this date there was found in close proximity to them a tick, which must have proceeded from them. It was small, shrunken, and apparently lifeless when found, its size being due to its empty condition. It was evidently a little more than half grown. Any one who is familiar with the habits of ticks will probably agree with me that this specimen came from the ears of the coyote, since there is hardly a chance that it could have reached its situation in any other way. It may have left the ears of its own accord, or perhaps it was shaken from them by the jolting of the wagon, which had been continuously on the road during the three days. Following is a description of the tick:

Tick from Coyote's Ear.—Length 2⅝ mm.; anterior width, 1½ mm. Coriaceous, grayish or bluish, thickly covered with well-developed spines on anterior half of dorsum especially, also on sternal portion of venter. Mouth-parts nearly the same as in the tick from horses' ears (Jour. N. Y. Ent. Soc. i, No. 2, June, 1893), the fourth joint of palpi considerably shorter than the third joint. The spiny anterior portion of body projects anteriorly, in a rounded median angle, over the capitulum, the mouth-

parts being more or less sunken. Ends of palpi and rostrum just visible from above. Legs same, each terminated with a pair of curved, strongly hooked claws; no suckers. Spiracles marked by a conical tubercle, directed backward.

One alcoholic specimen from ear of *Canis latrans*. Color noted before immersion in alcohol, which has turned it to a dark reddish brown. This is perhaps the same species as that found in horses' ears, and above referred to. It agrees with that form in all respects not mentioned above.

NEW MYRIAPODA FROM NEBRASKA.

By F. C. KENYON, University of Nebraska.

Lithobius sexdentatus n. sp.—Robust, light brown, head darker; smooth, slightly pilose. Head subobtundate, a little longer than broad; posterior coxæ laterally armed; anal and penultimate legs armed with two claws; antennæ, articles rather long, 20–21; ocelli 19–24 in four rows; prosternal teeth six, short; coxal pores round, in a single series, 4, 4, 5, 4—4, 5, 5, 4. Spines of first pair of legs 1, 2, 1; of penultimate pair 1, 3, 3, 2; of anal pair 1, 3, 2, 1; posterior legs not long. Fifth joint of anal legs somewhat crassate; last two joints not sulcate; claw of ♀ genitalia strong, curved, and with a minute lobe on the outer side; spines 2 + 2, outer one longer. Length 12 mm.

From Pine Ridge, Sioux County, Nebraska.

Lithobius nebrascensis n. sp.—Robust, scuta slightly arched, the larger scuta subequal; smooth, very pilose: brown, head chestnut. Head subcordate, longer than broad; coxæ of anal legs laterally armed; penultimate and anal legs with one claw; antennæ, articles long, 20–21; ocelli 10 in three rows; prosternal teeth 4, short; dental lamina rounded; coxal pores round, in a single series, 2, 3, 3, 2—3, 4, 4, 4. Spines of first pair of legs 1, 1, 1—1, 2, 1; of penultimate pair, 1, 3, 3, 2; of anal pair, 1, 3, 2, 0; posterior legs short, anal legs scarcely crassate, claw of (♀) genitalia strong bipartite. Spines straight, subequal, inner shorter. Length 11 mm.

Two specimens, one from West Point, the other from Sioux County, Nebraska.

Lithobius dorsopinorum n. sp.—Rather depressed, smooth, sparcely pilose; yellowish, head orange. Head of about equal length and breadth; posterior coxæ unarmed; anal penultimate and first pair of legs with one claw; antennæ filiform, articles rather long, 21; ocelli 11–15 in three rows; prosternal teeth 2 + 2—2 + 3 short; dental lamina rounded, teeth short; coxal pores round in a single series, 3, 4, 4, 3—4, 5, 5, 4. Spines of first pair of legs 0, 2, 1—1, 2, 1; of penultimate pair, 1, 3, 2, 1—1, 3, 3, 2; of anal pair 1, 3, 2, 1; posterior legs rather long, not crassate. Claw of genitalia (♀) short, broadly tripartite. Spines 2 + 2 short, straight, outer the longer. Length 9–14 mm.

Six specimens from Pine Ridge, Sioux County, Nebraska.

ON AN UNDESCRIBED FORM OF GLOVERIA.

By B. NEUMOEGEN and HARRISON G. DYAR.

Family LASIOCAMPIDÆ.

Synopsis of Subfamilies.

Vein 8 of secondaries outwardly united to subcostal vein by a cross-vein forming two cells . . . . . **Phyllodesminæ.**
Vein 8 of secondaries free outwardly; one discal cell . **Clisiocampinæ.**

Subfamily CLISIOCAMPINÆ.

Synopsis of Genera.

Thorax hairy.
Vein 8 of primaries from the subcostal . . . . **Clisiocampa.**
Vein 8 from a stalk.
Vein 8 of secondaries with a costal spur.
Antennæ long and slender . . . . . **Hypopacha.**
Antennæ shorter, pectinations decreasing to tip . . **Artace.**
Vein 8 of secondaries with two costal spurs . . **Dendrolimus.**
Thorax with a central patch of scale-like hairs . . . . **Tolype.**

Genus **Dendrolimus** Germar.

1824 Germ., Syst. Prodr. p. 48.
Gloveria Packard.
1872 Pack., Rept. Peab. Acad. iv, p. 89.

Synopsis of North American Species (females only).

Gray; subterminal line distinct.
Subterminal line sharply and regularly dentate . . **arizonensis.**
Subterminal line undulate, irregular . . . . . **dolores.**
Brown-gray; subterminal line obscure . . . . . **gargamelle.**

D. dolores n. sp. ♀.—Similar to *D. arizonensis*, but the transverse lines are more obscure, and the subterminal line is roundedly undulate, not dentate, the outer angles of the dentations of *arizonensis* being lost in this form. In the interspace between veins 3 and 4 there is a larger projection of the line than elsewhere. Male unknown. *Habitat*, Arizona.

Mr. Edwards, in describing *dentata* (Papilio iv, 107), has redescribed the species already characterized by Dr. Packard as *arizonensis*, and has left this form without a name. Though closely allied to *arizonensis*, it has the aspect of a species rather than that of a variety.

Of these three species, the male of one only is known to us, namely that of *D. gargamelle* Strecker. It differs markedly from the ♀, and will be found described by Mr. Edwards as "*Gloveria arizonensis* ♂" (Papilio iv, 107) as well as in Dr. Strecker's paper (Proc. Acad. Nat. Sci. Phil. 1884, p. 286).

EXCHANGES

Not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at end of the column, and only when necessary those at the top (being longest in) are discontinued.

Coleoptera.—Price-lists wanted.—J. H. Bomberger, Box 76, Columbiana, O.

Lepidoptera.—Cocoons of *Attacus columbia* Smith to exchange for native lepidoptera, or for books on North American lepidoptera.—Robert H. Wolcott, Phi Delta Theta House, Ann Arbor, Mich.

Lepidoptera.—I am studying the Noctuid genera *Euclidia*, *Drasteria* and *Litosea*. Specimens bought, exchanged or determined.—M. V. Slingerland, Cornell Insectary, Ithaca, N. Y.

Lepidoptera.—Wanted to purchase cocoons and larvæ from different parts of U. S. State name and price.—E. J. Kruegeman, 54 May St., Lake View, Chicago, Ill.

Lepidoptera.—Wanted to exchange, papers on N. Am. Lepidoptera for Noctuidæ or Heterocera generally. Noctuidæ named for privilege of retaining desiderata.—John B. Smith, New Brunswick, N. J.

Coleoptera of N. Am. and Mexico wanted by purchase or exchange; large collection.—Fred. C. Bowditch, Tappan St., Brookline, Mass.

Lepidoptera.—Wanted, *Plusia balluca*, *metallica* and *ampla;* also the Hydrœcias. Have some of the rarer eastern Noctuids for exchange.—Henry Bird, Rye, N. Y.

Coleoptera and **Hemiptera**, European and exotic, also postage stamps of Roumania, offered for American Hemiptera-Heteroptera unnamed.—A. L. Montandon, Strada Viilor filarete, Bucarest, Roumania.

Phryganidæ wanted; will exchange choice Coleoptera and Lepidoptera from Kansas, Colorado and New Mexico (Prof. F. H. Snow's collecting) for Caddice-flies, U. S. or exotic.—Vernon L. Kellogg, Univ. of Kansas Lawrence, Kansas.

Lepidoptera.—Good exchange or cash given for specimens of *Nadata doubledayi* Pack. Also wanted any of the rarer Notodontidæ and Limacodidæ.—Harrison G. Dyar, 599 Broadway, New York City.

Coleoptera.—I wish to obtain Entomological literature in any language, especially that treating of Coleoptera and for works not in my possession will give good insects from the West and from Alaska, mostly Coleoptera. —H. F. Wickham, Iowa City, Iowa.

Lepidoptera.—I have for exchange *C. semidea*, *A. montanus*, *S. modesta* (imagos and pupæ), and other White Mountain material. The rarer Sphingidæ preferred.—R. Ottolengui, 115 Madison Ave., N. Y.

Lepidoptera (diurnal) of Iowa to exchange for species of same order not in my collection.—Henry G. Willard, Grinnell, Iowa.

Celeoptera.—Price-lists wanted.—Dr. E. B. Stephens, Plymouth, Mass.

Cynipidæ.—Named or unnamed Cynipidæ wanted by purchase or exchange. Always accompany the flies with their galls when possible.—C. P. Gillette, Ft. Collins, Col.

Orthoptera.—For exchange: Mexican Lepidoptera, unmounted, for literature, in any language, on N. A. Orthoptera. Also Indiana Orthoptera for others from any part of N. A.—W. S. Blatchley, Terre Haute, Ind.

Orthoptera.—I desire to procure, by purchase, exchange, or for identification, specimens of the genus *Spharagemon* from all parts of the country. —Albert P. Morse, Wellesley College, Wellesley, Mass.

Lepidoptera.—Cocoons and pupæ of the rarer moths, *luna*, *imperialis*, *regalis*, *P. fraterna*, *P. pithecium*, etc.; also many fine set specimens; hybrids from *selene* et *luna*, *ceanothi* et *cecropia*, *Gloveri* et *cecropia*. List exchanged.—Emily L. Morton, Newburgh, N. Y. (New Windsor delivery).

Lepidoptera.—I will exchange or sell specimens (imagos or larvæ) from Illinois for those of other localities. Have on hand prepared sets of last year's collecting.—Arthur J. Snyder, North Evanston, Ill.

Lepidoptera.—Prepared larvæ, live pupæ, Coleoptera and Reptiles from America desired in exchange for species of Europe.—A Voelschow, Schwerin in Mecklinburg, Germany.

Lepidoptera, Coleoptera and **Hemiptera** of Colorado for exchange.—E. V. Beales, 1650 Larimer Street, Denver, Col.

Coleoptera for exchange: good species in perfect condition. Cicindelidæ, Endomychidæ and *Leptura* are especially wanted.—L. B. Walton, Box 123, Keuka College, Yates County, N. Y.

Lepidoptera.—I wish to exchange large, sound pupæ of *Cecropia* and *Polyphemus* for pupæ or imagines of almost any other species of Lepidoptera.—James Tough, 234 S. Water Street, Chicago.

Lepidoptera.—American diurnals wanted. Will buy or exchange. Hesperidæ and Lycænidæ especially desired.—Henry Skinner, Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera.—A few rare Indian Lepidoptera to exchange for rare species from the Northwest.—Levi W. Mengel, Reading, Pa.

Odonata.—Dragonflies. Species not in my collection wanted from all parts of the world. N. American species given in exchange, or named by special agreement.—P. P. Calvert, Acad. of Nat. Sciences, Phila., Pa.

Lepidoptera.—Imagines and pupæ of New England species for pupæ of *Megathymus yuccæ* and *Sphinx catalpæ*.—Field Brothers, Guilford, Ct.

Coleoptera and **Lepidoptera.**—I desire to exchange specimens with collectors in the South and West who wish to extend their collections; correspondence solicited.—F. W. Russell, M.D., Winchendon, Mass.

I am desirous of collecting in any of the Orders in Northwestern Ohio; write me.—N. Sager, Jr., Herring P. O., Allen Co., Ohio.

Diurnal Lepidoptera.—I will be pleased to correspond with collectors with view to exchanging Lepidoptera of the world. I usually have 2000 or 3000 mounted duplicates on hand, in perfect condition.—A. G. Weeks, Jr., 360 Washington St., Boston.

Correspondence and exchange of insects desired with young entomologists, especially in the Southern and Western States and Mexico.—Stewart N. Dunning, 43 Niles St., Hartford, Conn.

I desire to dispose of Japanese insects by sale or exchange; correspondence solicited.—Otoji Takahashi, Tokio, Japan.

Coleoptera.—*Aegialites Fuchsii* Horn, Trans. Am. Ent. Soc. xx, p. 143, 1893. I offer this rare and interesting species in exchange for Coleoptera not in my coll. Address C. Fuchs, 212 Kearney St., San Francisco, Cal.

Lepidoptera.—I desire to obtain eggs or larvæ of *Eacles regalis* and *Sphinx modesta;* will exchange for other good material.—Hermann Aich, 43 Murray St., New York.

Lepidoptera.—I have a large number of duplicates which I offer for sale or exchange Address G. Cleveland, 17 Elm St., Oneonta, N. Y.

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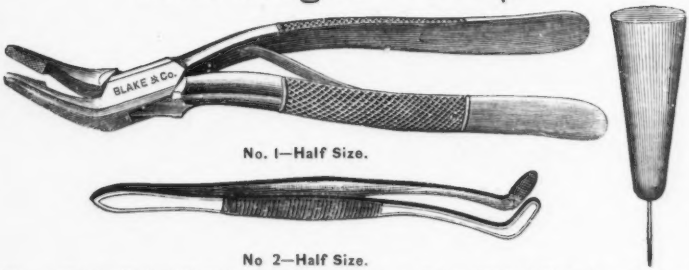

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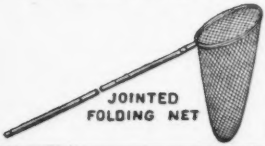

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